



Power Generation Technologies

A DIVISION OF TESC

Fax Number: 435-864-66798

Date:	3/15/2002 5:16 PM	
To:	Les Lovell	
400000000	Intermountain Power Service Corporation	
Phone:	435-864-6539	
From:	Jeffrey Rabensteine	
Charge No.:	010400.02	Number of Pages: 17
		(including this one)

Message:

Dear Lovell:

Attached is the requested proposal for conducting steam turbine performance tests per Intermountain Power Service Corporation Specification Number 45563. We appreciate the opportunity to bid on this work for you. If you have any questions regarding the proposal, please feel free to contact me.

Sincerely,

Jeff Rabensteine

158mes - PTis + when they will get them back

Power Generation Technologies
200 Tech Center Drive Knoxville, TN 37912
Tel: (865) 688-7900 Fax: (865) 687-8977
Web: www.pgt-online.com E-Mail: pgt1@envirosys.com

088-7 F.01 F-560

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TO:

Leslie B. Lovell

Intermountain Power Service Corporation

850 West Brush Wellman Road

Delta, Utah 84624-9546

FROM:

Jeffrey A. Rabensteine

Power Generation Technologies, a Division of ESC

200 Tech Center Drive Knoxville, Tennessee 37912

DATE:

March 15, 2002

SUBJECT:

Proposal for Specification Number 45563, Turbine Performance Testing,

Bid Opening on March 15, 2002

QUOTATION:

P02-1223

Scope

Power Generation Technologies (PGT), a division of ESC, proposes to provide steam turbine performance testing services to Intermountain Power Service Corporation (IPSC) in accordance with IPSC Specification Number 45563. Specifically, PGT will furnish a test crew and test instrumentation to meet the requirements of the IPSC specification.

Test Crew

PGT proposes to provide a two person test crew to support all aspects of the on-site performance testing identified in the IPSC specification. The PGT test crew is trained and experienced in handling and setup of high-precision instrumentation, interfacing the instrumentation with a data acquisition system, conduct of performance tests, and reduction and analysis of test data.

Test Instrumentation

PGT proposes to provide test instrumentation that meets the requirements set forth in Attachment II of the IPSC specification. Preparation of all PGT supplied temporary test instrumentation will be completed at the PGT Equipment Rental and Calibration Laboratory. This will include preparation, calibration, and check-out of all requested instruments and shipping of these instruments to the

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project site.

PGT's Equipment Rental and Calibration Laboratory is capable of providing instrumentation that meets applicable test code requirements. Additionally, PGT's Laboratory has been accredited by the American Association for Laboratory Accreditation (A2LA) and maintains an active quality assurance program that is designed to meet the technical and quality requirements of our clients.

Schedule

The proposed schedule of the subject testing for both Unit 2 and Unit 1 is outlined below.

Unit 2

Activity	Duration	Anticipated Dates
Test setup (during Unit 2	Seven days	March 31, 2002 through April
shutdown)		6, 2002
Performance testing	Seven days	April 7, 2002 through April 13,
		2002

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Activity	Duration	Anticipated Dates
Test setup (during Unit 1 shutdown)	Seven days	March 30, 2003 through April 5, 2003
Performance testing	Seven days	April 6, 2003 through April 12, 2003

Pricing

The pricing for the proposed scope of work is presented on the bidding documents included in Attachment II. Additional pricing assumptions and stipulations are presented below.

- The proposed pricing is based, in part, on the proposed schedule for on-site activities presented above. Additional days on-site (or delay days), if required, will be billed at the rate of \$1,940 per day for a two person test crew.
- The proposed pricing is based, in part, on the assumption of a single mobilization of the test crew for the testing on Unit 2 and a single mobilization of the test crew for the testing on Unit 1. Additional mobilizations of the test crew, if required, will be billed at the rate of

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\$8,163 per event.

- The proposed pricing is based, in part, on the assumption of a total of one month of test instrumentation rental for the testing on Unit 2 and one month of test instrumentation rental for the testing on Unit 1. Additional equipment rental, if required, will be billed at the rate of \$20,827.
- The proposed pricing is based, in part, on the assumption of a single mobilization of the test equipment for the testing on Unit 2 and a single mobilization of the test equipment for the testing on Unit 1. Additional mobilizations of the test equipment, if required, will be billed at a rate of \$7,103 exclusive of additional calibrations. Additional calibrations, if required, will be billed at a rate of \$15,386 for a complete recalibration of the test instrumentation.
- The proposed pricing is based, in part, on the assumption that post-test calibration of pressure transmitters will not be required. Should IPSC request post-test calibration of pressure transmitters, these will be billed at a rate of \$107 per transmitter.
- The proposed pricing does not include support of the HP Turbine Enthalpy Drop (30-day follow-up) testing for either Unit 2 or Unit 1 as this is required only in the event that station instrumentation indicates a significant drop in performance following the performance test. If HP Turbine Enthalpy Drop tests are required, they will be billed at the rate based pricing presented above and in Attachment II.
- Due to the short lead time of the work to be performed on Unit 2, PGT requests formal notification of award by March 18, 2002. This notification is required to ensure the availability of personnel and key equipment, in particular the requested potential transformers and ultra high accuracy feedwater flow measurement differential pressure transmitters. Additionally, PGT assumes that standard 14.4KVAC/12VAC potential transformers will suffice.

Exceptions

Exceptions to the IPSC specification are presented below.

• PGT does not recommend conducting calibration of temperature sensors at two immersion depths as this may, in fact, increase the uncertainty of the calibration above the specified requirement. If the intent of this requirement is to correct for stem conduction errors, PGT recommends insulation of the sensors following installation to reduce these errors to negligible values.

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Terms and Conditions

See Attachment I for the Standard Terms & Conditions.

Approved by:	1	H-	世	Date:	3/	15	10-	2

Jeffrey A. Rabensteine Vice President, ESC

Director, Power Generation Technologies

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Approved by:	doch r	MULL	Date:	3/15/02

Ron O. Webb

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President, ESC

Power Generation Technologies 200 Tech Center Drive Knoxville, TN 37912 Tel: (865) 688-7900 • Fax: (865) 687-8977 Web: www.pgt-online.com • E-Mail: pgt1@envirosys.com



ATTACHMENT I

POWER GENERATION TECHNOLOGIES STANDARD TERMS AND CONDITIONS

Purchase Orders / Contracts

A purchase order or contract must be received prior to initiation of work or mobilization of Power Generation Technologies (PGT) personnel and equipment. Please issue all purchase orders and contracts to:

Power Generation Technologies
A Division of Environmental Systems Corporation
200 Tech Center Drive
Knoxville, TN 37912

Schedule

PGT specializes in meeting the demanding and dynamic schedules of our Clients. PGT can normally initiate projects and mobilize personnel and equipment with minimal advance notice. Specific schedule requirements should be negotiated prior to contract award.

Postponement or cancellation of a scheduled test, after receipt of contract, can result in additional charges for preparation, equipment rental or equipment shipping.

Payment Terms

For project work that is bid on a task or milestone basis, PGT will submit monthly invoices for the work performed during that month on a percent complete basis. Additionally, upon final completion of a task or milestone, PGT will submit an invoice for the balance of the lump sum amount associated with that task. For work that is bid on a T&M or rate basis, PGT will submit invoices for the work as performed. The invoice will be due and payable within 30 days from the date of the invoice.

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Equipment Rental

Equipment rental will be charged in accordance with the rate structure presented within the proposal. The rate structure presents both a first month rental charge and a subsequent month rental charge. Unless otherwise specified, the first month rental charge is inclusive of equipment rental charges for the first month of rental as well as equipment preparatory and calibration charges. For equipment rental periods of less than or equal to one month, the full, first month rental charge applies. For equipment rental periods that extend beyond the first month, the subsequent month rental charge applies for each additional month. For partial month rentals, subsequent to the first month, the rental charge will be pro-rated. The rental period begins on the day that the equipment ships from PGT's Laboratory and ends on the day that the equipment is received at PGT's Laboratory.

The return delivery address for all equipment is:

Power Generation Technologies A Division of Environmental Systems Corporation 200 Tech Center Drive Knoxville, TN 37912

All equipment shipments are FOB Knoxville. Equipment shipping will be charged in accordance with the rate structure presented within the proposal.

The Client assumes liability in the amount of the full replacement price for the loss, theft, damage, or destruction of any equipment provided on a rental basis throughout the rental period. This excludes loss, theft, damage, or destruction that occurs as a result of equipment shipments that are arranged and paid for by PGT.

All calibration standards are traceable to the National Institute of Standards and Technology (NIST), natural physical constants, or accepted industry standards.

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In the event of rental equipment malfunction, PGT will provide limited technical support. If repairs are necessary, replacement units will be shipped within three (3) working days.



PGT requires that plant personnel install power meters as necessary prior to testing and remove power meters during the removal task of instrumentation.

Software

Power Generation Technologies (PGT) provides both sales and leases of its proprietary software. The software may be copied for use only by the party purchasing, or leasing the software. No portion of the software shall be made available to a third party without prior written approval by PGT. Title to, and ownership of, the software shall at all times remain with PGT. PGT further reserves the right to further develop the software for use by PGT or other PGT clients.

Warranty

PGT warrants that its services are performed with the usual thoroughness and competence of the engineering profession. No other warranty or representation, either expressed or implied, is included or intended.

Liability

PGT's liability to the Client for injury or damage to persons or property arising due to work performed for the Client for which legal liability may be found to rest upon PGT will be limited to the amount of the contract with that Client.

Test Personnel

On international projects, PGT requires a minimum of two people in a test crew for safety and flexibility should unanticipated situations arise.

On international projects, PGT requires the Client to provide all local transportation after arrival at the airport. This will include pick up of the PGT test crew at the airport, and transportation to their hotel. The Client must also provide an interpreter for the duration of the proposed work.

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PGT reserves the right to <u>switch out personnel after three weeks</u> on site at the expense of the Client. PGT will notify the appropriate Client contact prior to switching personnel.

Upon issuance of a contract or purchase order, the Client agrees to not employ the assigned PGT personnel for a period of one year from the completion of the project.

This proposal is valid for 60 days from date of issue.

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ATTACHMENT II

BIDDING DOCUMENTS

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PROPOSAL

The undersigned hereby proposes to furnish instrumentation, equipment, and labor and perform **Turbine Performance Testing** at the Intermountain Power Service Corporation in accordance with **Specifications 45563**.

The undersigned agrees, upon the acceptance of this Proposal by IPSC, to provide materials and complete testing as detailed in the documents identified in Part D of said Specifications for furnishing and delivering the items embraced in the accepted Proposal at the prices named in the accompanying Proposal Schedule.

The undersigned declares under penalty of perjury that such Proposal is genuine, and not sham or collusive, nor made in the interest or in behalf of any person or entity not herein named, and that the bidder has not directly or indirectly induced or solicited any other bidder to put in a sham bid, or any other person, firm, or corporation to refrain from bidding, and that the bidder has not in any manner sought by collusion to secure for itself an advantage over any other bidder.

I declare under penalty of perjury under the laws of the state of Utah that the foregoing is true and correct.

Date:	March 15		***
Bidder.	Power Generation Technolog	gies, a Division of	ES
Address:	200 Tech Center Drive		
	Knoxville, TN 37912		*************
Signed B	iy: <u>J.J. (2 M. ja v.</u> (Authorized Signature)		
Print Nan	ne: Ron O. Webb	AND THE PROPERTY OF THE PROPER	
Title:	President. ESC		

PART C - DIVISION C2

BIDDING DOCUMENTS - PROPOSAL SCHEDULE

Proposal is hereby made to furnish instrumentation, equipment, and labor and perform Turbine Performance Testing. F.O.B. IPSC Turbine Deck in accordance with Specifications 45563, as follows:

1.	Unit 2	Firm Price	\$ 110,47	2				
2.	Unit 1	Firm Price	\$ 110,47	2				
3.	Additional work to be	performed at rates sub	mitted on Attachm	ent I.				
but not		hall be firm, and shall in ation, equipment, labor		perform testing, including obilization, travel, and				
payme	erms: A discount for nts made within\(\mathbb{N}/\) of invoice.	prompt payment is offe A calendar days	red of after date of accep	percent for Contract otance or delivery and				
<u>Taxes</u> :	The foregoing quoted	d prices are exclusive of	fall applicable sale	s and use taxes.				
Form o organiz		on: The bidder shall sta	ite below the form	of its business				
Bidder	Bidder is: Corporation (Corporation, Partnership, Limited Partnership, Individual)							
If a partnership, the bidder shall state below the names of the partners. If a corporation, the bidder shall state below the names of the president and of the secretary.								
	Ron Webb	Managara da	David G	rab				
	President		Secreta	ry				
Person	to Contact: Should IF	SC desire information	concerning this Pro	pposal, please contact;				
Name:	Jeffrey Rabenste	ine T	elephone No:	865-688-7900				
Address	3: 200 Tech Center	Drive, Knoxville, T	N 37912					

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ATTACHMENT I Labor Rate and Expense Sheet

The bidder shall complete this Labor Rate Sheet listing each category and level of labor likely to be utilized within this Contract. Hourly Rates shall be provided for straight time, overtime, weekends, and holidays for each category of manpower.

Labor Category	Straight Time Rate	Overtime/Weekend Rate
TEST ENGINEER	\$100/HR	\$100/HR
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Living Expenses:

All costs of residing near the power plant and transportation to and from the plant for purposes of work execution during scheduled work days shall be billed at the rate of \$175 /day. This daily rate shall include, but not be limited to, room, board, phone, ground transportation, laundry, and miscellaneous living expenses. Entertainment expenses shall not be included for reimbursement with living expense receipts.

F2-11

PART C - DIVISION C3

BIDDING DOCUMENTS - ADDITIONAL BID INFORMATION

- 1. <u>Detailed Information</u>: The bidder shall furnish the following detailed information for the work to be performed.
 - a. <u>References</u>: A list of references shall be provided listing previous test experience. This reference list is to include a utility contact name, telephone number, where and when the test was conducted, and test methods used.

Refer to Attachment III



ATTACHMENT III

PARTIAL SUMMARY OF EXPERIENCE

Benchmark Performance Evaluations/Performance Trending Programs

This typically includes the development of both: (1) economic models of the variable costs for use in contract negotiations; and (2) unit performance models for use in the optimization of unit operation.

CLIENT

PLANT

NCP

Ada Cogeneration Facility

Enron

Texas City Cogeneration Facility

Enron

Milford Cogeneration Facility

Enton

Richmond Cogeneration Facility

Thermal Performance Acceptance Testing.

CLIENT	PLANT	TYPE OF TEST
ABB	Barranquilla (S. America)	Overall Plant Acceptance
ABB	Belle Meade	Overall Plant Acceptance
ABB	Saskatchewan (Canada)	Overall Plant Acceptance
ABB	J.K. Smith	Overall Plant Acceptance
ABB	Placerita	Overall Plant Acceptance
ABB	Richmond	Overall Plant Acceptance
ABB	E.W. Brown	Overall Plant Acceptance
ABB	Marcus Hook	Overall Plant Acceptance
Black & Veatch	Barbers Point Cogen	Steam Turbine Cycle Acceptance
Black & Veatch	Hugo	Steam Turbine & Boiler Acceptance

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Power Generation Technologies

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Black & Veatch	Cane Island Station	Overall Plant Acceptance
Chugach Electric	Beluga	Overall Plant Acceptance
CRS Sirrine	L'Energia Cogen	Overall Plant Acceptance
TIC	E.W. Brown	Overall Plant Acceptance
Zum/NEPCO	Pasco Cogen	Overall Plant Acceptance
Zurn/NEPCO	Lake Cogen	Overall Plant Acceptance
Zurn/NEPCO	Messena Cogen	Overall Plant Acceptance
Zurn/NEPCO	Silver Springs	Overall Plant Acceptance
Zum/NEPCO	Pedricktown	Overall Plant Acceptance

Thermal Performance Optimization and Consulting

<u>City Utilities of Springfield. Southwest Power Station</u> - Performance testing to provide a baseline data set to be used in conjunction with an On-Line Performance Monitoring System. The scope of services included overall plant testing to determine unit net heat rate, unit net electrical output, steam generator efficiency, heat input to the turbine cycle, gross turbine heat rate, high pressure feedwater heater performance, boiler feedwater pump performance, and the HP and IP enthalpy drop efficiencies.

<u>Siemens Westinghouse Steam Turbine Group</u> - Conducted an assessment of a PTC-6 Steam Turbine Performance Acceptance Test Uncertainty Analysis for a recently completed test. The test results were being contested, and PGT provided an independent analysis of both the pre-test and post-test uncertainty analyses.

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Suggested References

Jason Zoller Black & Veatch (913) 458-2209

Phil Webster Black & Veatch (913) 458-7597

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March 15, 2002

Proposal Number OM/765
Project Name: Turbine Performance Testing

Mr. Leslie B. Lovell Purchasing Section Intermountain Power Service Corporation 850 West Brush Wellman Road Delta, UT 84624-9546

Dear Mr. Leslie Lovell,

Thank you for considering Edison O & M Services for your performance testing needs. We are submitting this proposal in response to your request for Turbine Performance Testing at Intermountain Generating Station.

Our desire is to help your business and your employees succeed in today's environment. The following proposal details how we can help you achieve that objective.

We look forward to the opportunity of working with Intermountain Power Service Company (IPSC) and consider ourselves privileged to have you as our customer. If you have any questions or comments regarding the information provided, please feel free to call Mike Baker at 714-626-4610 or 562-577-4072 for commercial detail, or Sam Gibson at 310-345-6821 for technical and manpower availability issues.

Sincerely,

Carlos Alcaino Vice President

Cc: File

Edison O & M Services is pleased to submit the following proposal in response to IPSC's Specification 45563.

Facility

This work will be performed at the: Intermountain Generating Station 850 West Brush Wellman Road Delta, UT 84624

Scope of Service

Edison O&M Services shall provide supervision, labor, materials, instrumentation and consumables to perform the following scope of services:

- Perform Turbine Performance Testing on IGS Unit 2 in April 2002
- Perform Turbine Performance Testing on IGS Unit 1 in April 2003

Scope Detail

- HP Turbine Enthalpy Drop tests to be performed approximately 30 days following the turbine performance tests are not included in the fixed price
- Edison O & M Services shall complete the work in a workmanlike manner and ascertain that the Work is performed in accordance with the applicable codes and standards.
- Edison O & M Services shall contact the IPSC authorized representative in a timely manner if there are any problems or changes from the original work scope.
- Edison O & M Services shall have a quality control program in place, which meets the requirements of this specification.
- Acceptance of completed work shall include, but not be limited to, conformance to the requirements of this Specification. Receipt by IPSC of all documentation materials shall demonstrate conformance with the stated criteria.

Schedule

Work will begin on a mutually agreed to date upon receipt of Purchase Order, and with availability of Edison O & M Services personnel.

- Estimated start date for IGS Unit 2 is Monday, April 1, 2002 and work is to be completed by April 13, 2002.
- A Turbine Enthalpy Drop test on IGS Unit 2 would also be performed on May 7 to 9, 2002.
- Estimated start date for IGS Unit 1 is Monday, March 31, 2003 and work is to be completed April 12, 2003.

• A turbine Enthalpy Drop test on IGS Unit 1 would also be performed on May 6 to 8, 2003

Price

Work is quoted Fixed Price as follows:

Unit 2 Performance Testing, including Valves Wide Open (VWO) kW Turbine Capacity Test.

\$185,000

* Unit 1 Performance Testing, including Valves Wide Open (VWO) kW Turbine Capacity Test. \$145,000

The prices quoted do not include the possible 30-day follow-up HP enthalpy drop tests. The cost for each of these follow-up tests is estimated at \$25,000 per unit. A fixed price will be provided after the scope of the test is defined, i.e. calibration requirements, etc.

The appropriate Time and Material rates are as follows:

Test Engineer \$125/hr. Straight Time, and \$187.50/hr. Overtime/Weekend Technical Specialist \$100/hr. Straight Time, and \$150/hr Overtime/Weekend \$150/day/person for all costs associated with room and board, travel to and from the hotel, and miscellaneous living expenses.

Assumptions

- 1. Subject to prior sale.
- 2. IPSC shall, if the Unit Outage start date/time is changed, provide at least 2 business days notice in advance of said change. This may be done via E-mail or in writing (such as a FAX). If EO&MS incurs costs due to not receiving such notice, EO&MS reserves the right to recover those costs from IPSC.

3. IPSC shall make available to EO&MS' personnel, when on site, a FAX machine for communicating with EO&MS.

- 4. IPSC shall provide EO&MS' personnel access to facilities such as restrooms and contractor lunchrooms.
- 5. EO&MS shall have access to its employees working at IPSC.
- 6. For additional work performed by subcontractors, the cost charged to IPSC would be the actual cost plus 15%.
- 7. For additional work consumables provided by EO&MS at cost plus 10%.
- 8. Any work performed outside of the stated scope of this proposal will be billed at the stated Time & Material rate. This additional work will be agreed upon between IPSC and EO&MS and formalized with a Field Change Order signed by an authorized IPSC representative prior to commencing additional work.

9. Time delays due to acts outside of EO&MS' control will be charged at contractor's time and material rate.

Terms and Conditions

This Purchase Order Agreement is in accordance with IPSC's Terms and Conditions included in Specification 45563 except as noted below.

Exceptions to Terms and Conditions

- 1. F2-8, 8b. <u>Temperature Measurement</u>. Honeywell STT-302 Temperature transmitters will perform the cold junction temperature compensation individually for each thermocouple
- 2. F2-8, 8b. <u>Temperature Measurement.</u> Type E thermocouples with removable 25 Ft extension leads will be utilized. The extension cables are made of high grade Type E extension cable and Type E thermocouple connectors. The extension leads are all from the same spool of wire, thus reducing the errors associated with calibration measurement using one extension, and process measurement with another
- 3. F2-9, 9b. <u>Temperature Calibrations</u>. Temperature calibrations will be performed at only one immersion depth. This immersion depth shall be <u>4 inches</u>.
 - 4. F2-8, 8d. <u>Electrical Load Measurement</u>. Due to the time constraints involved, we will be unable to supply the required potential transformers. Through exhaustive research, we have been unable to find transformers that meet the specifications listed and have the calibrations performed within the time allowed. We propose that the station metering potential transformers be used in the same manner as the station current transformers.
 - 5. F2-8, 8d. <u>Electrical Load Measurement.</u> We understand that the accuracy of the electrical load measurement needs to be measured with the least amount of uncertainty. Therefore, we suggest that the station have the metering circuits calibrated in-situ by an experienced electrical testing firm. This method might possibly be accomplished in the time frame required. As another alternative, the in-situ calibration could be performed during the first possible shutdown, and the corrections applied to the measurement results.

References

Company	Contact Name	Telephone	Location	Date	Method
Southern California Edison	Earle Saunders	(909) 394-8563	All Company Power Generating Units	1992 - 1998	PTC 6S
Southern California Edison	Jeff Babb	(805) 986-7254	Ormond Beach Generating Station, Unit 2	1994	PTC 6.1
Southern California Edison	John Mihatov	(805) 984-5213	Mandalay Generating Station, Unit 1	1996	PTC 6.1
AES Huntington Beach	Han Tan	(714) 374-1408	Units 1 and 2	1998 - 2002	PTC 6S
Reliant Energy	Victor Barrion	(909) 899-7208	Etiwanda Generating Station, Units 1-4	1998- 2002	PTC 6S
City of Los Angeles, Department of Water and Power	Donald Treinen	(310) 522-7503	Haynes Generating Station, Unit 5	2000	PTC 6S
City of Los Angeles, Department of Water and Power	Donald Treinen	(310) 522-7503	Haynes Generating Station, Unit 1	2001	PTC 6S
County of Los Angeles, Sanitation District	Hsin-Hsin Hsu Wong	(562) 699-6028, ext 6121	PERG Facility	2000	PTC 6S
AES Redondo	Jim Gurge	(310) 318-7425	Units 5 - 8	1998 - 2002	PTC 6.1, PTC 6S
AES Alamitos	Dauren Kylyshpekov	(562) 773-1375	Units 3 - 4	1998 - 2002	PTC 6S
Constellation Power	Graham Donaldson	(760) 396-2554	Colmac Unit 1	1999	PTC 6S
AES Placerita	Jennifer Lehman	(661) 510-5422	Unit 1	2001	PTC 46

Proposal Acceptance Signature

By signing this acceptance page, I hereby acknowledge understanding of, and indicate acceptance of, Proposal Number OM/000679/1/3/07/02/01, Unit 4 Transformer Pump/ Motor Replacement submitted to NRG El Segundo, LLC with its accompanying Terms and Conditions. Please fax the signed accepted letter to 714-626-4651.

Accepted by:	Title:
Date:	Purchase Order #:
Requisition Number:	